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HEALTH PHYSICS

AT-NB- 1685

APR 28 1978

W. M. E. E. E.

UNCLASSIFIED

INVENTORIED

FEB 10 1958

GAT

JAN 22 1979

Sept. 21, 1962

GAT INVENTORIED MAR 15 '85

GAT INVENTORIED NOV 03 1980

INVENTORIED
DOG ACCT.

AUG 13 1988

OCT 25 1984

W. M. E. E. E.

APPROVED FOR RELEASE BY
M. M. E. E. E.

UNCLASSIFIED

1957

May 24

Located six pieces of piping, various lengths, in Frishel Engine & Machine Shop, 33 East Water Street, Cincinnati, Ohio. This piping contained contamination from ^{below?} AL to 5000 c/m wipe, on 5 micron meter.

The piping was supposedly cleaned in Oak Ridge, & GAT decontamination records. Each piece ~~was~~ was marked decontaminated with the usual blue tag.

Contamination was visible on six of the ten pieces to be reworked by a privately owned Machine Shop. The six pieces were picked up by GAT on the 25th re-decontaminated at X-site, checked & found no detectable surface or wipe activity and returned to Frishel Machine Shop on the 25th.

APPROVED FOR RELEASE BY:

N.F. CHRISTOPHER

NRC DOE 3-25-00

4-27-57 Reviewed rough draft of "Interpretation of Continuous Air Rodenticide Monitor Indications" prepared by page 535. Noted major discrepancy in assumptions after discussion error was corrected and agreed with the proposed Development Memo.

Distributed 41 #23 film badges: 288 personnel, 26 equipment, 35 visitors for a total of 349.

no ~~to~~
enclosed sampling
ring major release
was formed a
an exhaust
for
the P.C. was used
the cell floor
in the ACK and
notes, according
recently
shops were then
detected.

It was further noted that areas remote from
exhaust grills ~~for~~ 300 feet were not contaminated.
On returning to the control room the shops were
checked with the following results.
Mr. Thompson (copper roles) 800 c/m.
Mr. Gannon (leather roles) 1000 c/m.
Mr. Kalman (nickel) 750 c/m.

This all bears out Mr. Thompson's theory that
the morning bins are the release from the warming
bins are causing the widespread contamination
on the cell floor and that personal shops are being
contaminated.

and B. Kalman
ended that on
is showed no
it in the immediate
never, it was
was in the ~~center~~
room 200-700
was ~~of~~ out of
tightly contained
and no contamination
the south of the
probably 20-30
was checked and
he ~~for~~ the
1 m. Floor sweeping
250 c/m.

2 floor and
x-25-6
shows indicates

T grill of the
use from 200-500
using in the
c/m

Participated in safety meeting for shops
personnel X-700 Rldg. General topics of radiation
about 15 attended

6/12/57 A Health Physics Surveyor M.D. Gentry
while on routine
survey, was approached by a local farmer,
Mr. Arthur Zimmerman. Mr. Z. related a
long history of misfortunes resulting from excessive
airborne fluorides and radiation from X-site.
His personal ailments as well as damage to his
property, all resulted, he said, from "gas" carried
toward his farm by the air. The surveyor said
as little as possible.

6/13/57 A.D. Bailey reported off ill.

① Rife checked 25 film pages 796. Per
Clip. 26 exp. 34 V section total 856.

6-13-57 MONITORED CONVERTER SHELL # 127-4-775
PRIOR TO SHIPMENT TO OAK RIDGE.
① SURFACE ACTIVITY AVERAGE WAS LESS THAN
2500 C/M, AND THE WIRE ACTIVITY EXTENSIVE
WAS LESS THAN 100 C/M AFTER BETA-BOMBARDMENT

shells and
mt. & Oak Ridge.

127V 85V

7 3750 cpm

than 100 cpm

One surface

The interior

500 cm surface
is activity.

35 had none

with and

2000 cpm.

Less the wire

has 1000 less

to lead had

is than 750 cpm

up.

of its heads

than 1 mcp/hr

ages 793 per
silica total

alpha activity

tation AD at

X-326 PW Area.

2 two non-

ing changes and

of which would

be activity. The

monitor was

1 that the

ted, the screen

used to change

1 that the two

men working in Cylinder Repair are to give
bi-weekly urine samples (on Friday afternoon
and Monday morning) for the remainder of June.
If the air samples continue to be above PAH,
additional investigation will be made.

6/6/57 Checked house from mechanical
surgeon in garage at the request
of Mr. Strausbaugh. no appreciable
contamination was indicated.

6/7/57 At request of Garage Foreman E. Strausbaugh,
checked Ford pickup E-9333. Floorboards
and remaining boards 850 cpm surface, 300 wipe.
Master cylinders, under side of floorboards, 350
wipe. Recommended decontamination. Checked
L.F. Remfield, #3209. 40th boards, 2nd issue clothing.

6/7/57 alpha activity results - Letter dated 6-5-57
40 specimens, 2 positive 21 measurement, Highest 32.0 D/m/100
ave of the measurement 3.93 D/m/100 mb.

6/7/57 Monitored the welding of a container of cable
the man that ~~was~~ did the welding wear a
mask. An air sample was taken & sent to
Woods lab of analysis.

Monitored twenty four tube spools

after decontamination in X-705. Eleven
spools were below MRP safe limits

Monitored the chimney in X-705 lunch
room. Eight chairs were above Pal
They will be decontaminated.

Installed continuous air monitor (Code
FA) in X-700 converter shop.

TO: J. C. Barnes

DATE: September 24, 1979

DEPT: 424

FROM DEPT: 923

LOCATION: X-746

CODE NO: GAT-923-79-228h

REFERENCE:

SUBJECT: PROBLEMS ASSOCIATED WITH SALE OF SURPLUS SCRAP ✓

The Industrial Hygiene and Health Physics Department, upon inspection of the "Clean" Scrap Yard salvage activities on September 20, 1979, determined the following problems exist:

1. Unmonitored scrap and debris is presently being dumped into the yard. This scrap is also being handled without gloves by the buyer.
2. Material belonging in "burn" barrels or in the "dump" is being placed in the scrap yard.
3. Equipment directly associated with process gas, such as blades, instrument lines, and instrument poanut valves have been found in material being loaded by the buyer. These items have been removed and found highly contaminated, however we cannot guarantee that all these items have been discovered before being loaded onto the purchaser's vehicle. The purchaser has stated that he has previously removed such items.
4. Process housing with visible contamination has been discovered in the yard.

We recommend that the sale of scrap materials be discontinued until these problems can be resolved and until GAT can ensure that buyers do not acquire radioactively contaminated items in violation of DOE directives. These problems have been discussed repeatedly with representatives of your organization.

The items listed above clearly indicate that procedures must be developed to handle the Salvage Scrap Yard. Areas of concern such as admission into the yard, monitoring items prior to entrance, securing the area, and segregation of metals must be addressed in order to prevent recurrence of the situation at hand. Please contact the Industrial Hygiene and Health Physics Department for any assistance.

C. N. Spradlin
C. N. Spradlin, Section Head
Industrial Hygiene & Health Physics

C. P. Blackledge, Jr.
C. P. Blackledge, Jr. Supervisor
Industrial Hygiene & Health Physics

CNS:CPB:ceh

cc W. D. Netzer
W. R. Schultz

BUSINESS CONFIDENTIAL

INTERDEPARTMENTAL CORRESPONDENCE

TO: Listed Distribution

DATE: June 25, 1982
FROM DEPT: 006
CODE NO: GAT-006-82-133
REFERENCE:

DEPT:
LOCATION:

SUBJECT: FEASIBILITY STUDY REVIEW FOR "GASEOUS EFFLUENT CONTROL"

A meeting was held on June 21, 1982 to discuss the above subject. The following people attended:

G. A. Lasham	Project Management
D. J. Rolph	Planning and Methods
A. L. Vausher	Environmental Control

Abe Vausher prepared a summary of the environmental regulations and results of his dispersion calculations. A copy of the summary is attached. The following topics were discussed.

Regulations can be divided into two types: federal and state. There are federal standards for fluoride emissions from specific industries, but there are no general standards for fluoride emissions. The term "total fluorides" is defined in these regulations as fluorine and fluorides; this definition is the same for all regulations.

In the Prevention of Significant Deterioration (PSD) regulations, a major source is defined as one that can emit 100 tons or more per year of any pollutant. The stated net significant increase for fluorides is 3 tons per year. The baseline date for emissions accounting was August 7, 1977. There apparently was some communication between GAT and DOE or EPA around that time.

For the purpose of his calculations, Vausher assumed that the GAT baseline fluoride emissions were 15 tons per year, including a 3 ton per year increase due to GCEP. Vausher used a dispersion model to calculate the fluoride concentration at the perimeter monitoring stations. The calculated values were close to the values derived from monitoring data. He then compared the calculated values to the standards for the states of Washington and Kentucky. Vausher found that the ambient concentration standards would be exceeded part of the time at current emission levels.

There was some discussion about the effect of background fluoride concentrations on the data. Vausher indicated that the calculated values do not include any background concentration. He set the point source emission rate at 15 tons per year and used the plantsite yearly wind rose to determine the fluoride concentration at each monitoring station. The dispersion model used is one recommended by the Federal EPA; the model and wind rose are also used to determine radionuclide concentrations for annual reports submitted to DOE. Vausher believes that the effect of background concentrations would be negligible.

APPROVED FOR RELEASE
W.T. Brown / DOE 3/25/00

The emission rate of 15 tons per year was used in the calculations for all three years examined; the differences in the calculated concentrations are due to differences in the yearly wind rose pattern. Because of the wide variation in values, it seemed reasonable to assume that some sort of average wind rose would be used for compliance purposes. Vausher will research this.

As part of his calculations, Vausher concluded that fluoride emissions should be reduced to 8.5 tons per year. The validity of this conclusion was discussed. The discussion centered on three issues: (1) effect of background concentrations, (2) variation due to differences in wind data, and (3) uncertainties in predicting a federal or state compliance program.

It was decided that the feasibility study review efforts should be continued and a report prepared to document the committee's findings. The report will basically cover the topics presented in the original outline (GAT-006-82-59), but the depth of analysis will not be as great. The committee members were asked to begin preparation of their write-ups. Gary Lasham was requested to enquire further into the UCC-ND line item, investigate the scrubber system installed at K-25, and determine why Paducah was permitted to install a large stack. Abe Vausher was requested to determine what information, if any, on fluoride emissions was provided to DOE and/or EPA in 1977. The next meeting will be Wednesday, June 30, at 9:00 in the Visitor's Conference Room.

DJ Rolph

D. J. Rolph
Planning and Methods

DJR:rkf

Attachment

Distribution:

J. C. Dikeman
G. A. Lasham
R. R. Miller
M. J. Rafferty
A. J. Saraceno
A. L. Vausher

GASEOUS EFFLUENT CONTROL
(Fluoride Emissions)

Promulgated Regulations For Fluoride Emissions	Applicability of Promulgated Regulations to GDP and GCEP
A. Federal Regulations	
1. Fluoride emissions from Aluminum Reduction Plants (40,CFR,60.190)	Not applicable.
2. Fluoride emissions from Phosphate Fertilizer Industries (40,CFR,60.200 -60.244)	Not applicable.
3. National Primary and Secondary Ambient Air Quality Standards (40,CFR,50.4 - 50.12)	No NAAQS for Fluorides.
4. Prevention of Significant Deterioration PSD (40,CFR,52.21)	
a. A major Stationary Source (52.21(b)(1) one of 28 sources designated in regulations) is a source with potential to emit 100 tons/yr. or more of any pollutant regulated under the CAA or any other source with potential to emit 250 tons/yr. or more of any pollutant.	Not applicable.
b. Significant Net Emissions Increase 52.21(b)(23)(i) is the potential of a source to increase emission levels by the increments presented in a list of "Pollutant and Emission Rates". This may be interpreted as being applicable to a new or existing source.	An increase of 3 TPY Fluorides from the present base level of fluoride emissions is considered significant.
c. Ambient Monitoring Requirement (40,CFR,52.21(m)): Continuous monitoring is required for all CAA pollutants with emissions greater than or equal to the specified significant net emission increases (3 TPY for fluorides)	EPA/State may exempt any CAA pollutant from monitoring requirement if the air quality impact of the net emissions increase is less than concentration listed in 40,CFR,52.21(i)(8) (0.25 ug/m ³ - 24 hour average for fluoride)

Promulgated Regulations For Fluoride Emissions	Applicability of Promulgated Regulations to PGDP and GCEP
<p>B. State Regulations</p> <ol style="list-style-type: none"> 1. Ohio: No regulations for fluoride have been promulgated up to this time. 2. Kentucky: Air regulations 401KAR 53:010 specified primary and secondary air quality standards for gaseous fluorides (expressed as HF). The table for the secondary air quality standards include: Annual arithmetic mean not to exceed $0.5 \mu\text{g}/\text{m}^3$. Max. one month average not to exceed $0.8 \mu\text{g}/\text{m}^3$. Max. 24-hr. average not to exceed $2.86 \mu\text{g}/\text{m}^3$. 3. Tennessee: Air Quality Standards for gaseous fluorides (expressed as HF) were presented in State Air Laws 1200-3-3.03. The list for the secondary air quality standards includes: 30 days max. average not to exceed $1.2 \mu\text{g}/\text{m}^3$. 24 hr. max. average not to exceed $2.9 \mu\text{g}/\text{m}^3$. 4. Washington: The state of Washington promulgated the most restrictive standards (WAC-18-48-130) for fluoride emissions. Each standard includes: Annual average not to exceed $0.5 \mu\text{g}/\text{m}^3$. 30 day average not to exceed $0.84 \mu\text{g}/\text{m}^3$. 24 hr. average not to exceed $2.9 \mu\text{g}/\text{m}^3$. 	<p>GDP and GCEP comply with OEPA regulations.</p> <p>N/A in the state of Ohio or EPA Region V.</p> <p>N/A in the State of Ohio or EPA Region V.</p> <p>N/A in the State of Ohio or EPA Region V.</p>

DATA COLLECTION

Collected Data	Comments
<p>1. Annual average fluoride concentrations are calculated for air sampled at each of the GAT five monitoring stations. These data are published in the GAT Environmental Monitoring Report for each calendar year. Evaluation of these concentrations for the period of 1976-1981 showed that many exceeded the $0.5 \mu\text{g}/\text{m}^3$ standard.</p>	<p>Emissions from GDP exceeded the annual average standard established by the State of Washington and the State of Kentucky 83% of the time.</p>
<p>2. Analysis of monthly samples collected from the five monitoring stations during CY-1981 showed fluoride concentrations in the range of $.272\text{--}4.29 \mu\text{g}/\text{m}^3$.</p>	<p>Monthly concentrations exceeded the Tennessee standard of $1.2 \mu\text{g}/\text{m}^3$ a total of 13.3% of the time. Also, the GAT monthly concentration exceeded the Washington State standard of $.84 \mu\text{g}/\text{m}^3$ a total of 13.3% of the time.</p>
<p>3. Fluorides uptake in vegetation: The annual average concentration of fluoride in vegetation collected from 24 off-site locations are reported in the GAT Environmental Monitoring Report. Range of average concentration of fluoride for the period of CY-1976 to CY-1981 was $2 \pm .5 \mu\text{g}/\text{g}$ in the spring season. Range of average concentration of fluorides for the same period in the fall was $3 \pm .7$ to $8 \pm 4 \mu\text{g}/\text{g}$.</p>	<p>Published information shows that $30 \mu\text{g}/\text{g}$ of fluoride in vegetation is a safe concentration for cattle and $> 250 \mu\text{g}/\text{g}$ can cause accute reaction.</p>

Calculated Concentrations of Fluoride at Four Sample Locations:

A total emission of fluorides from GDP and GCEP was estimated to be 15 ton/yr. for computation purposes. A dispersion model was used to calculate concentrations of fluorides at the four sample stations located in the North, East, South and West of the plant. The following table presents a comparison between the concentrations calculated by the dispersion model and the range of analytical concentrations which were reported in the Environmental Monitoring Report for the same time periods of CY-1981, CY-1980, and CY-1979.

Calendar Year	Station 24-North		Station 12-East		Station 3-South		Station 29-West	
	Calculated Average $\mu\text{g}/\text{m}^3$	Reported Range $\mu\text{g}/\text{m}^3$	Calculated Average $\mu\text{g}/\text{m}^3$	Reported Range $\mu\text{g}/\text{m}^3$	Calculated Average $\mu\text{g}/\text{m}^3$	Reported Range $\mu\text{g}/\text{m}^3$	Calculated Average $\mu\text{g}/\text{m}^3$	Reported Range $\mu\text{g}/\text{m}^3$
1981	0.5	<.29-4.29	0.16	<0.27-30	0.32	<.27-2.9	0.2	<.27-2.3
1980	0.88	<.36-1.87	0.14	<.26-3.33	0.82	<.35-1.71	0.28	<.29-1.81
1979	0.68	0.29-1.28	0.15	0.29-1.64	0.38	0.29-0.71	0.18	0.29-0.70

Fluoride emissions were assumed to be 15 tons/yr. which include the 3 TPY significant net increase. Evidently, the maximum average of $0.88 \mu\text{g}/\text{m}^3$ calculated by the dispersion model for station 24 in CY-1980 should be reduced to $0.5 \mu\text{g}/\text{m}^3$. Such reduction in concentration can be achieved when maximum potential emission rate of 15 tons/yr. is reduced to 8.5 tons/yr. $\frac{0.5}{0.88} \times 15 = 8.5 \text{ tons/yr.}$

Recommendation:

The dispersion model calculations are recommended by Federal Regulation 40CFR, 52.21(1) where as the secondary air quality standard of $0.5 \mu\text{g}/\text{m}^3$ of fluorides was adopted by the State of Washington and the State of Kentucky. Our goal is to reduce the fluoride emissions including the increment net significant increase of 3 TPY in order to meet the ambient air quality standard adopted by the State of Kentucky and the State of Washington. Although compliance with such standards is not obligatory, it may be thought of as a potential standard.

October 5, 1954

U. S. Atomic Energy Commission
Portsmouth, Ohio

Attention: Mr. Kenneth A. Dunbar
Manager, Portsmouth Area

Subject: FLUORINE AIR POLLUTION AT GAT PLANT SITE

Gentlemen:

In connection with our operation of the gaseous diffusion plant during the coming months considerable amounts of fluorine will be released to the atmosphere from time to time as waste gas. The escape of such waste gas cannot be avoided due to physical limitations of the design of the fluorine disposal unit.

Fluorine is an extremely toxic and highly reactive chemical. The potential liabilities associated with its release to the atmosphere stem mainly from the effect on crops. Aside from the foliage damage which can occur from excessive fluorine exposure, certain crops, such as corn, may absorb fluorine and cause damage to livestock fed from these crops.

There is also the possibility that on occasion the concentration of fluorine in the air will be sufficient to cause temporary or permanent injury to persons in the immediate area.

Further, the release of this acrid gas to the atmosphere could very easily result in adverse publicity.

Although the release of such gas is a situation beyond our control, we are calling it to your attention at this time so that the Commission may take any action which it deems appropriate to minimize the consequences associated therewith, with particular reference to the possibility of impaired public relations. We have in mind early pronouncements to the effect that this operation would not result in the dispersal of offensive wastes into the area.

APPROVED FOR RELEASE BY:
M. M. Earnhardt

U. S. Atomic Energy Commission
Attn: Mr. Kenneth A. Dunbar

- 2 -

October 5, 1954

We are hopeful that within six to twelve months modifications of plant design may result in the elimination of any venting of fluorine to the atmosphere.

Very truly yours,

General Manager

A. J. Graciatro
GAT

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M. M. Earnhardt